



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,163	10/11/2001	Daniel Xu	INTO-0008-US(P12501)	9107
7590	02/12/2004		EXAMINER	
Timothy N. Trop TROP, PRUNER, HU, P.C. 8554 KATY FWY, STE 100 HOUSTON, TX 77024-1805			KEBEDE, BROOK	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/975,163

Applicant(s)

XU, DANIEL

Examiner

Brook Kebede

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-12 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5 and 7-12 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5 and 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "A method comprising: forming a tapered electrode for a phase-change memory cell; and forming a trench using the tapered electrode as a mask" in lines 1-4. However, the recited claim lacks clarity in its meaning and scope for the following reason:

It is not clear how and where the trench is formed as recited in claim 1. As result the claim lacks clarity in its meaning and scope. Therefore, the claim is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2-5 and 7-12 are also rejected as being dependent of the rejected independent base claim.

Applicant's cooperation is requested in reviewing the claims structure to ensure proper claim construction and to correct any subsequently discovered instances of claim language noncompliance. See *Morton International Inc.*, 28USPQ2d 1190, 1195 (CAFC, 1993).

In light of the rejection 35 U.S.C. § 112 second Paragraph that set forth herein above, the following 35 U.S.C. 102 rejection is based on prior art which reads on the interpretation the claim language of the instant application as best as understood by the Examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 and 7-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Pryor et al. (US/4,845,533).

The rejection that was mailed on November 12, 2003 is maintained and repeated herein below as of record.

Re claims 1-5 and 7-12, Pryor et al. disclose a method comprising: forming a tapered electrode (38 40 42) for a phase-change memory cell; and forming a trench (see Figs. 2 and 3) using the tapered electrode as a mask (see Figs. 1-3) including covering said tapered electrode with an insulator (70); including forming a pair of tapered electrodes for a pair of adjacent phase-change memory cells, covering the electrodes with an insulator and forming a trench between the covered tapered electrodes as a mask (see Fig. 2 and 3); including self-aligning the trench to the tapered electrode; including forming a tapered electrode by isotropically etching; including forming junctions below said tapered electrode; including forming a plurality of layers of different doping levels; including forming said layers by ion implantation; including etching said layers using the same isotropic etch used to form said tapered electrode; including forming a tapered substrate portion below said tapered electrode; including forming a conical-shaped substrate portion covered by said tapered electrode; including covering said tapered substrate portion with an insulator and anisotropic etching said covered tapered substrate portion (see Figs. 1-3; Col. 5, line 40 – Col. 13, line 24).

Remarks

5. The drawings objection under 37 CFR 1.83(a) is withdrawn in view of Applicant's amendment that was filed on November 24, 2003.
6. The specification objection of the Office action of November 12, 2003 is withdrawn in view of Applicant's amendment that was filed on November 24, 2003.
7. The claim Objection of Claims 3 and 6 of the Office action of November 12, 2003 is withdrawn in view of Applicant's amendment that was filed on November 24, 2003.
8. The rejection of claim 8 under 35 U.S.C. § 112 first paragraph is withdrawn in view of Applicant's amendment that was filed on November 24, 2003.

Response to Arguments

9. Applicant's arguments filed on November 24, 2003 have been fully considered but they are not persuasive.

With respect to claims rejection under 35 U.S.C. § 112 second paragraph, Applicant argued that "the requirement that the trench be formed using the tapered electrode as the mask defines with sufficient particularity where the trench must be. It must be aligned with the electrode, obviously. Beyond this, it is not believed that one skilled in the art would need any further help . . ."

In response to the applicant's argument, the Examiner respectfully submits that such an argument is not commensurate with the scope of the claims, in particularly, as stated above. The Examiner respectfully disagrees with Applicant's contention, i.e., "the trench be formed using the tapered electrode as the mask defines with sufficient particularity where the trench must be. It must be aligned with the electrode," because the response is speculative and the rejected claim did not point out where the trench is formed. One cannot assume that the trench must be formed at certain location because of the electrode. In addition, the rejected claim does not recited the

Art Unit: 2823

trench is formed in alignment with the electrode. Further, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the trench aligned with the electrode) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, the Examiner respectfully submits that Applicant did not present adequate support where the trench is formed. Is that into the substrate ? Is that into another layer rather than substrate ? and etc. As result, the scope of the claim also cannot be determined.

Therefore, the rejection under 35 U.S.C. § 112 second paragraph is still deemed proper.

With respect to claims rejection under 35 U.S.C. § 102, Applicant argued that "Pryor does not teach forming a trench whatsoever, much less forming a trench using the tapered electrode as a mask. This must be so, because in Figures 1-3 there is no trench. Moreover, there is no trench that possibly could have been formed using either electrode as a mask. . . ."

In response to the applicant's argument, the Examiner respectfully submits that such an argument is not commensurate with the scope of the claims, in particularly, as stated above. The Examiner respectfully submits that, in contrary Applicant's argument, Pryor et al. '533 teach forming trench using the tapered electrode as mask. The Examiner respectfully submits Figs. 1-3 of Pryor et al. '533 herein below:

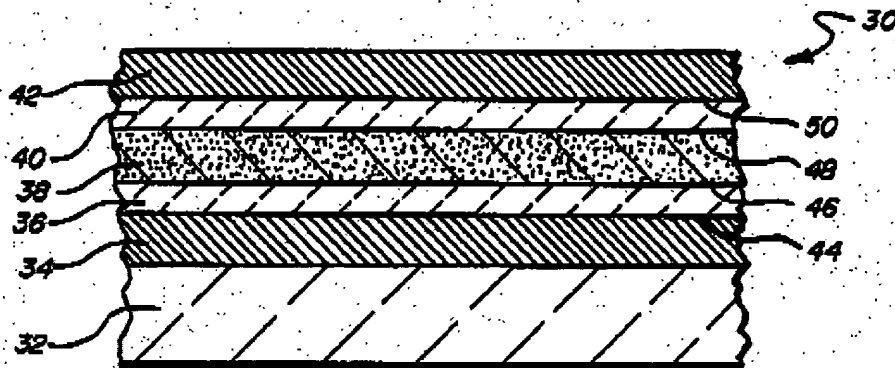


FIG. 1

As shown above, layers **38**, **40** and **42** are etched the form the tapered electrode as depicted in Fig. 2 as follows:

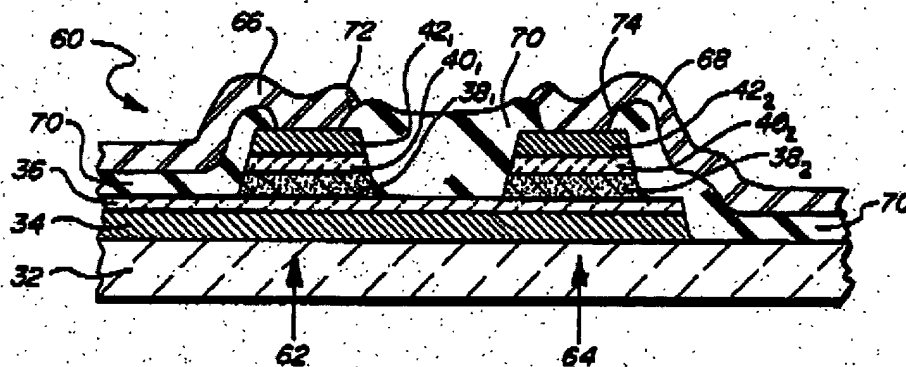


FIG. 2

Note that in Fig. 2, layers **34** and **36** are not etched. However, in Fig. 3 layers **34** and **36** are etched using the tapered electrode (**38 40 42**) as a mask as shown below in Fig. 3 to form a trench (cut in).

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2823

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

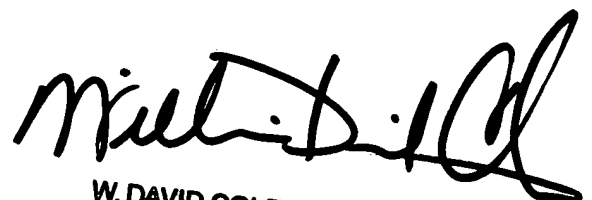
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (703) 306-4511.

After February 4, 2004, the Examiner should be contacted at (571) 272-1862. The examiner can normally be reached on 8-5 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

BK
February 1, 2004


W. DAVID COLEMAN
PRIMARY EXAMINER